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Value of Healthcare Information Technology To Public Health

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Overview

- US Healthcare
- EHR Definition
- The Value Proposition for HIT
  - ACPOE
  - HIEI
- The Value of HIT to Public Health

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US Healthcare Delivery Challenges

- **Medical error, patient safety, quality and cost issues**
  - 40% of outpatient prescriptions unnecessary
  - 1 in 5 lab and x-ray tests ordered because originals can not be found
  - Patient data unavailable in 81% of cases in one clinic
  - 18% of medical errors are estimated to be due to inadequate availability of patient information.
  - Patients receive only 54.9% of recommended care
  - 49% of notifiable diseases reported to CDC
- **A fractured and 'unwired' healthcare system**
  - 1 in 4 prescriptions taken by a patient are not known to the treating physician
  - Medicare beneficiaries see 1.3 – 13.8 unique providers annually, On average 6.4 different providers/yr
  - 90% of the >30B healthcare transactions in the US every year are conducted via mail, fax, or phone

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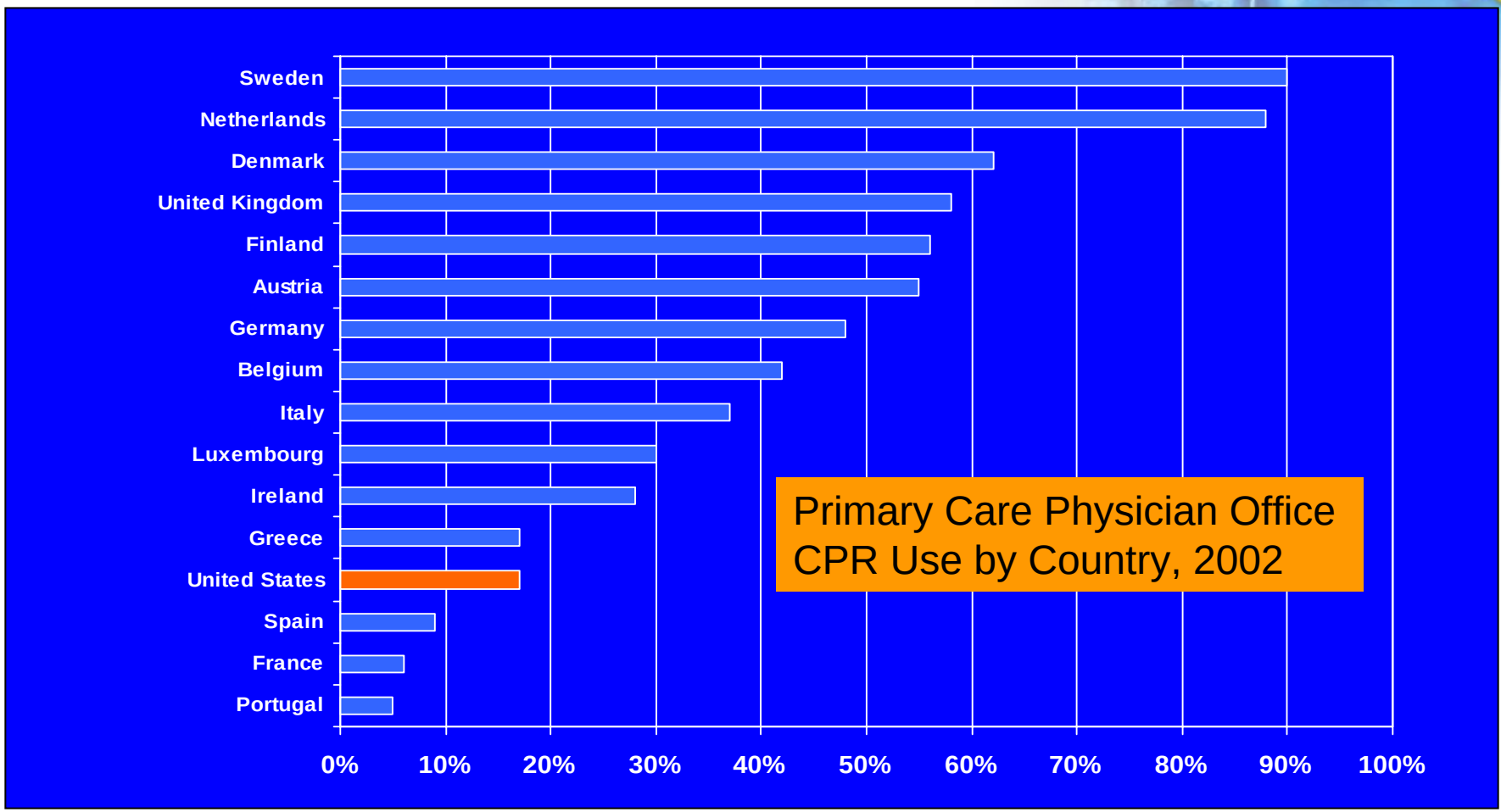
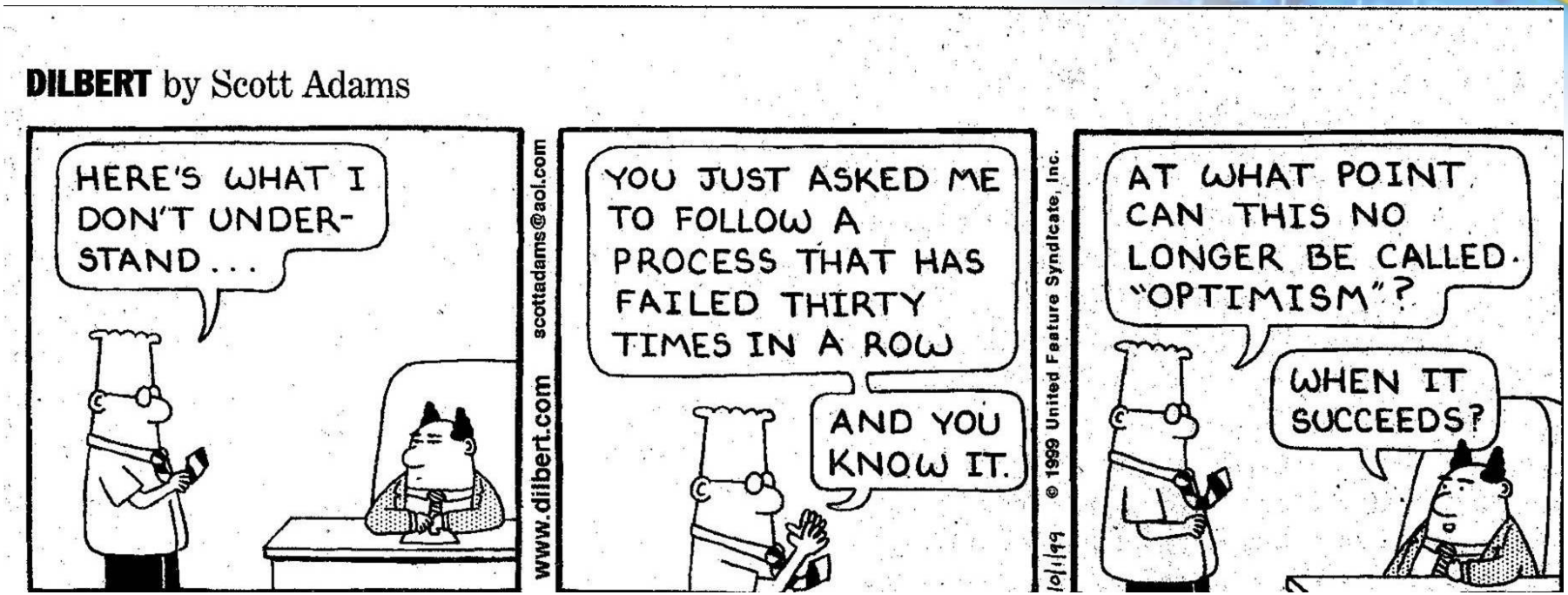
The "CPR Adoption Gap": The United States vs Others



Source: "European Physicians Especially in Sweden, Netherlands, and Denmark, Lead U.S. in Use of Electronic Medical Records." Harris Interactive Health Care News 2(16).

Dilbert Wisdom…



EHR Definition

- Wikipedia Free Encyclopedia:
  http://en.wikipedia.org
- An **electronic health record (EHR)** is a medical record and any other information relating to the past, present or future physical and mental health, or condition of a patient which resides in computers which capture, transmit, receive, store, retrieve, link, and manipulate multimedia data for the primary purpose of providing health care and health-related services.

Critical EHR Functions

- **Core Functionalities for an Electronic Health Record System**
  - Results Management
  - Health Information and Data
  - Order Entry/Management
  - Decision Support
  - Electronic Communication and Connectivity
  - Patient Support
  - Administrative Processes
  - Reporting & Population Health Management

Tang PC, and the IOM Committee on Data Standards for Patient Safety. Letter Report: Key Capabilities of an Electronic Health Record System. Institute of Medicine, July, 2003.

The Value Proposition for EHR & HIT

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- Headlines:
  - ROI of Partners Longitudinal Medical Record
    - $31K Savings per provider
  - Value of ACPOE suggest
    - $28K savings per provider
    - 12x greater ROI with advanced systems, but 4x more expensive
    - Basic ACPOE systems do not produce positive returns
  - Value of Healthcare Information Exchange
    - $78B year nationally

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ACPOE System Classification

Class	Medication (Rx) OE	Diagnostic (Dx) OE
1: Basic Rx- only	Structured data capture, passive references, no patient data, no EDI	
2: Basic Rx-Dx		
3: Intermediate Rx-only	Rx & Order-specific decision support, limited patient data, no EDI	
4: Intermediate Rx-Dx		
5: Advanced Rx-Dx	Sophisticated Rx & Order-specific decision support, maximum patient data, full EDI	

The "Average" Outpatient Provider

- Full-time ambulatory provider
- Panel size: approximately 2,000
- Annual visits: 3,875
- Capitation rate: about 11.6%
- Total Rx, Lab, Radiology expenditures (almost $1.2M):
  - Rx: $650K
  - Lab: $166K
  - Radiology: $355K

Clinical Impact of ACPOE

- Per “average” provider, Advanced ACPOE systems would prevent…
  - 9 ADE/yr
  - 6 ADE visit/yr
  - 4 ADE admission/5yr
  - 3 life-threatening ADE/5yr

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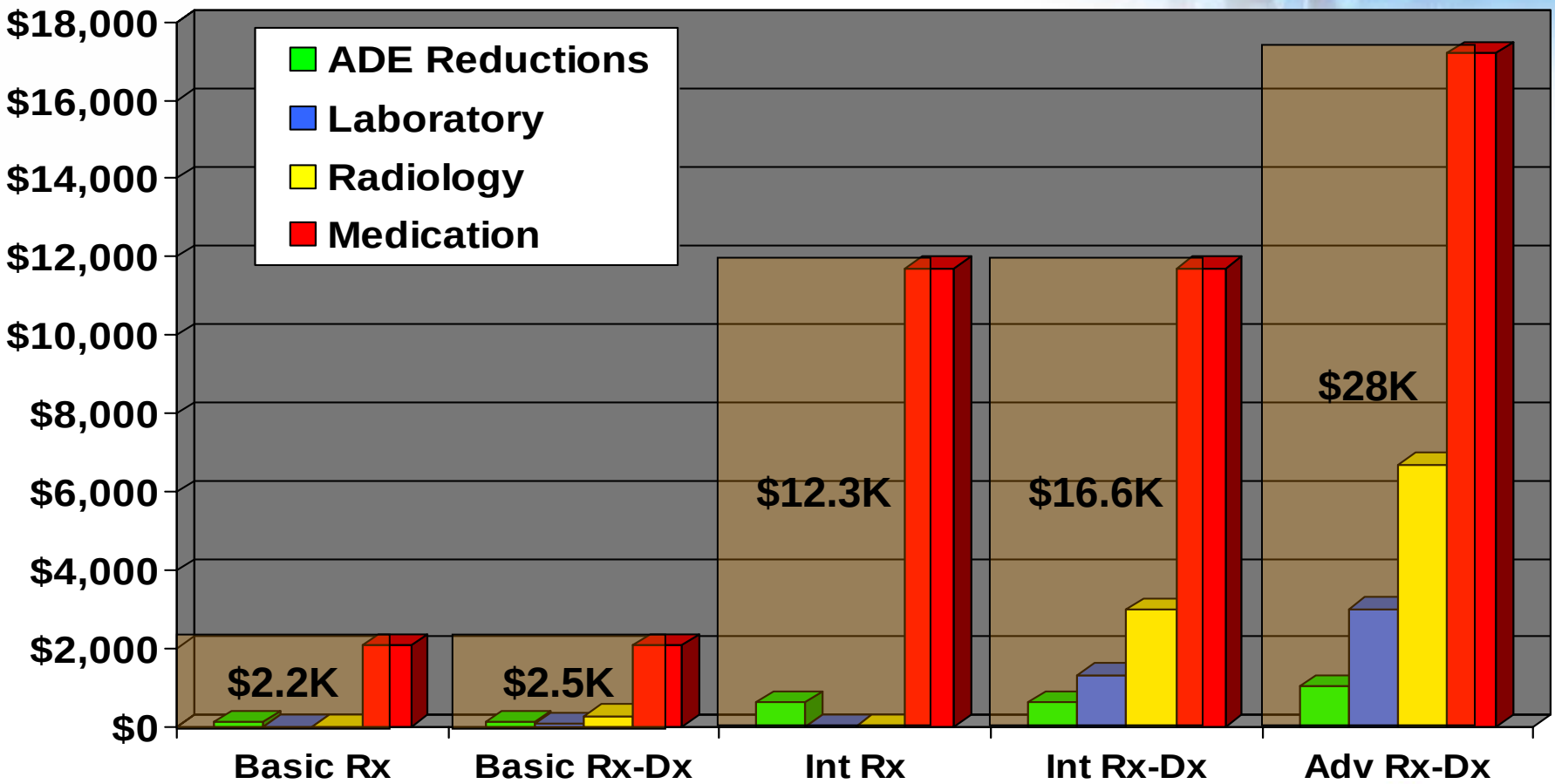
Per "Average" Provider Annual Cost Saving Projections



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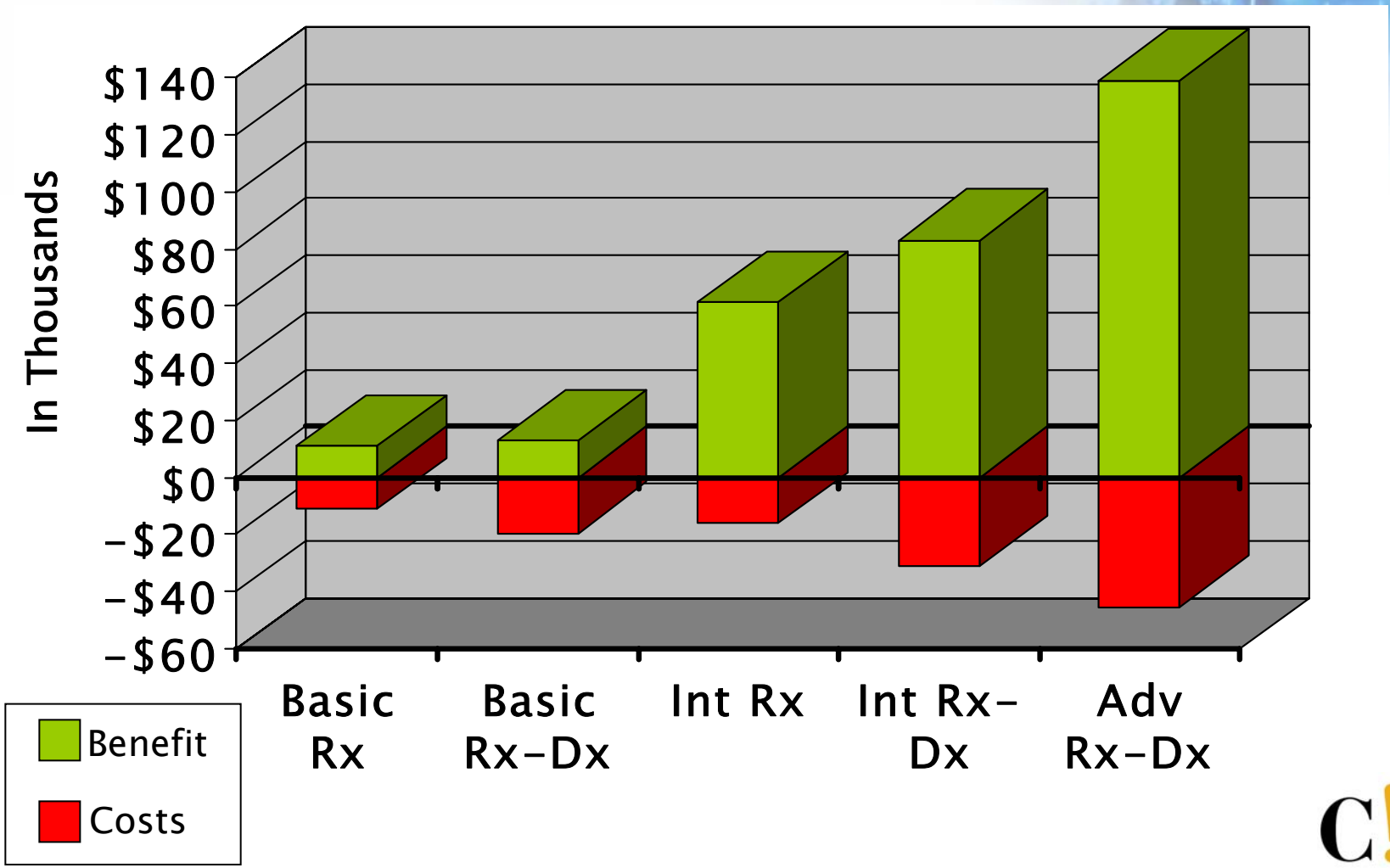
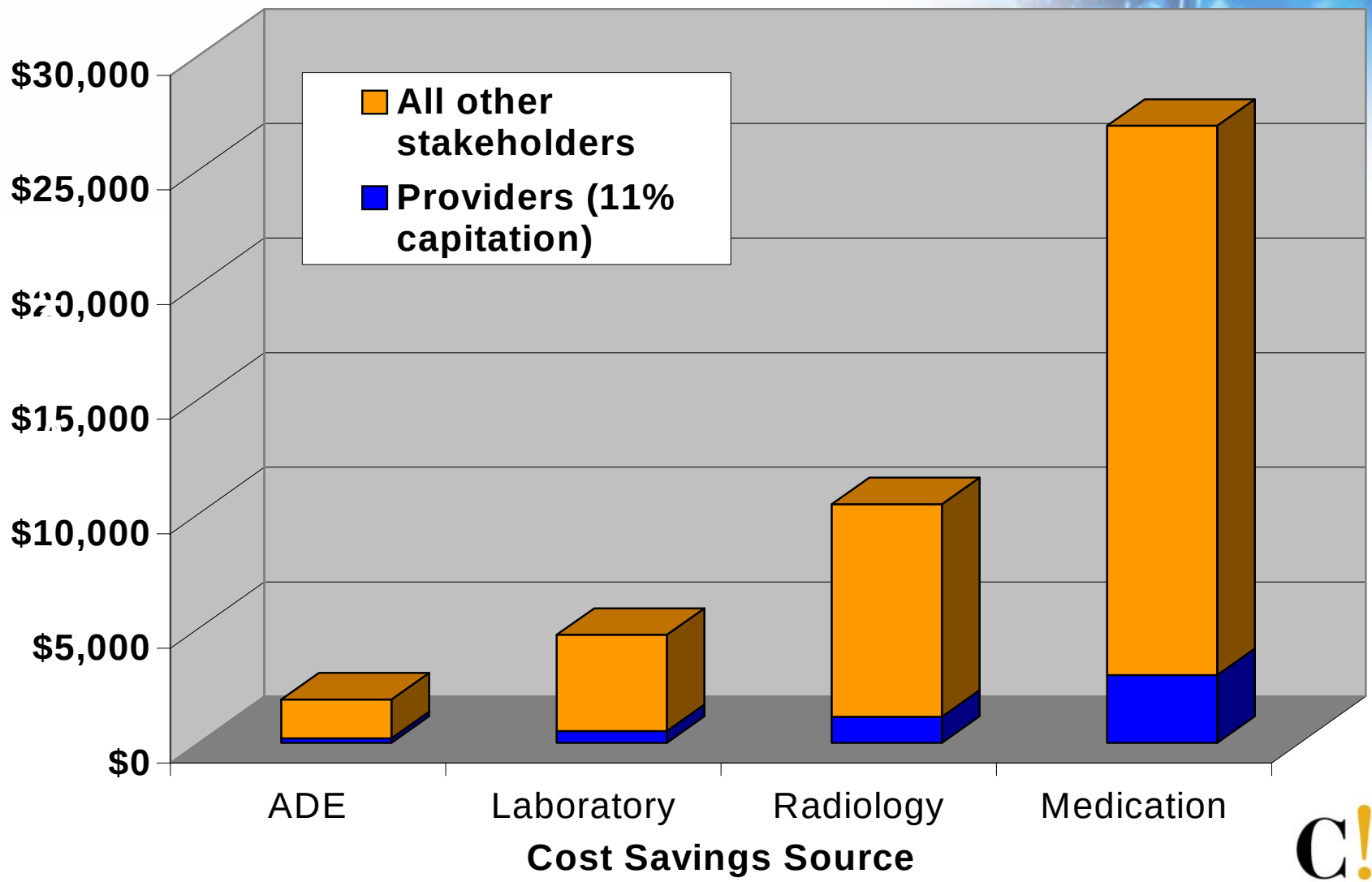
5 Yr Net Cost-Benefit for 25 Providers



National Cost Savings to Providers and Other Healthcare Stakeholders



US Healthcare System Will Benefit with ACPOE

- National adoption of Advanced ACPOE systems would prevent…
  - 2 million ADE/yr
  - 190,000 ADE admission/yr
  - 130,000 life-threatening ADE/yr
- Nationwide implementation of advanced ACPOE could:
  - Save the US $44 billion annually

Value of HIEI: Key Findings

- **Standardized, encoded, electronic healthcare information exchange would:**
  - Save the US healthcare system $337B over a 10-year implementation period
  - Save $78B in each year thereafter
  - Total provider net benefit from all connections is $34B
  - Net benefits to other stakeholders:
    - Payers $22B
    - Laboratories $13B
    - Radiology centers $8B
    - Pharmacies $1B
    - Public Health $0.1B

- **Dramatically reduce the administrative burden associated with manual data exchange**
- **Decrease unnecessary utilization of duplicative laboratory and radiology tests**

Walker, J et al Health Aff 2005 Jan 19

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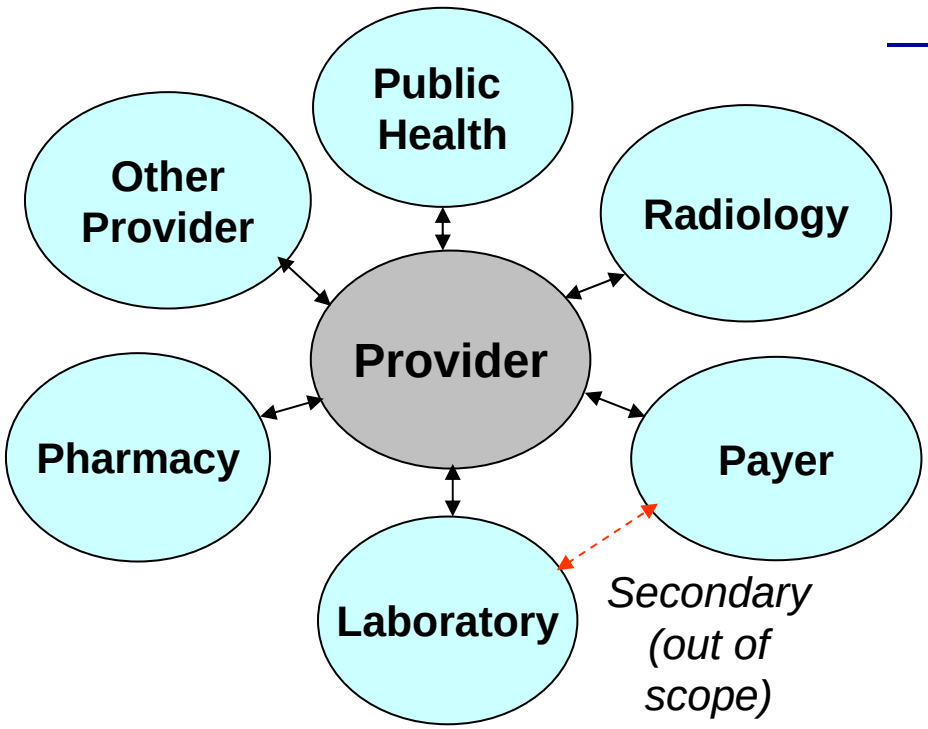
HIEI Definition

- Provider-centric encounter-based model of clinical information exchange



—Clinical and administrative transactions and data exchange

- Between providers and other providers
- Between providers and labs, pharmacies, payers, radiology centers, and public health departments

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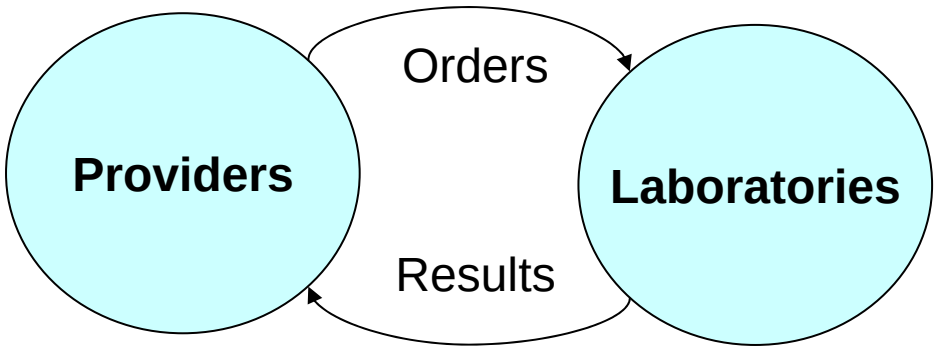
HIEI Taxonomy

Level	Description	Examples
1	Non-electronic data	No PC/information technology
2	Machine-transportable data	Fax/Email
3	Machine-organizable data	Structured messages, non-standard content/data
4	Machine-interpretable data	Structured messages, standardized content/data

Provider-Laboratory HIEI Overview



Level	Attributes
1	Paper laboratory orders carried by patient or courier and results delivered by mail or reported verbally
2	Faxed laboratory orders and results
3	Free text electronic laboratory orders and results
4	Encoded, standardized electronic laboratory orders and results

Provider-Lab Key Components

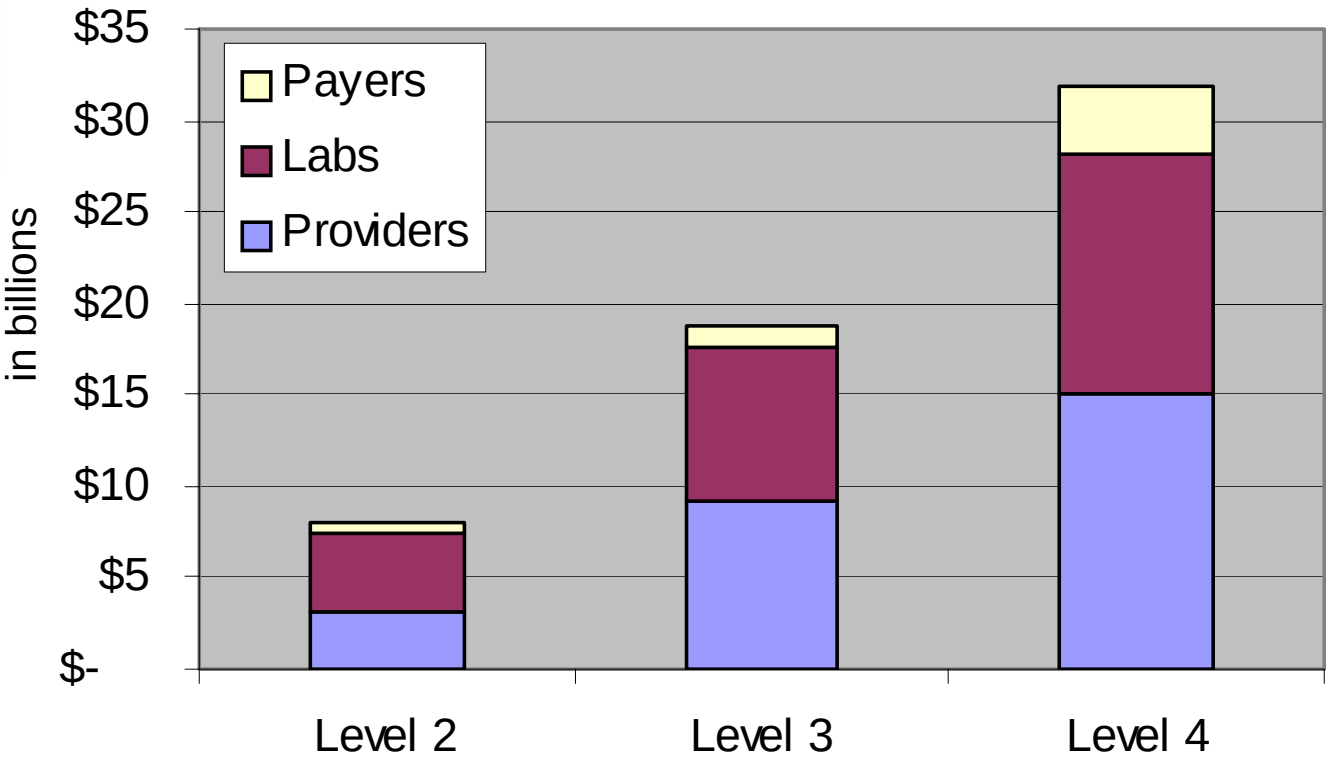
- Modeled tests ordered during outpatient visits to hospital-based and free-standing clinician offices
- Assume that 100% of tests ordered in free-standing clinician offices are sent to external labs; esoteric tests sent-out from hospital-based clinics
- Provider-Lab HIEI will:
  - Reduce redundant lab tests
  - Save provider time ordering tests and receiving results
  - Save lab time receiving test orders and sending results

Provider-Lab HIEI

- Benefits
  - Improve clinician access to longitudinal test results
  - Reduce redundant tests
  - Eliminate errors from reporting results verbally
  - Make cost information available, optimize ordering
  - Save time ordering tests, sending and receiving results

- Evidence re current rate of redundancy
  - Experts estimated HIEI impact on redundancy and time

Provider-Lab Annual Benefit



- Of the $31.8 billion benefit at Level 4:
  - 13.6%, or $4.3 billion, is from reducing the number of redundant tests
  - 86.4%, or $27.5 billion, is administrative benefit

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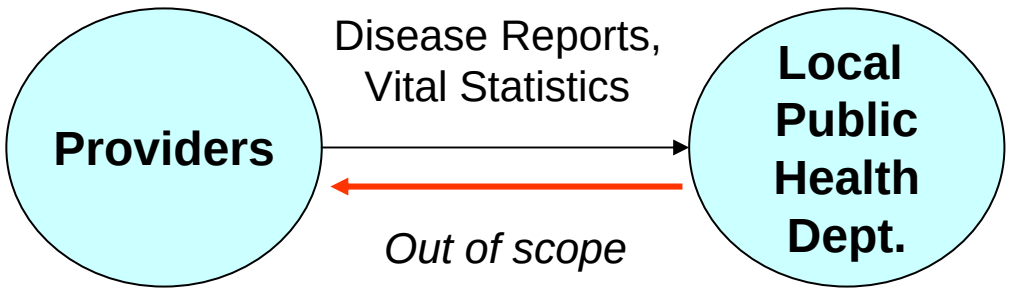
Provider-Public Health HIEI

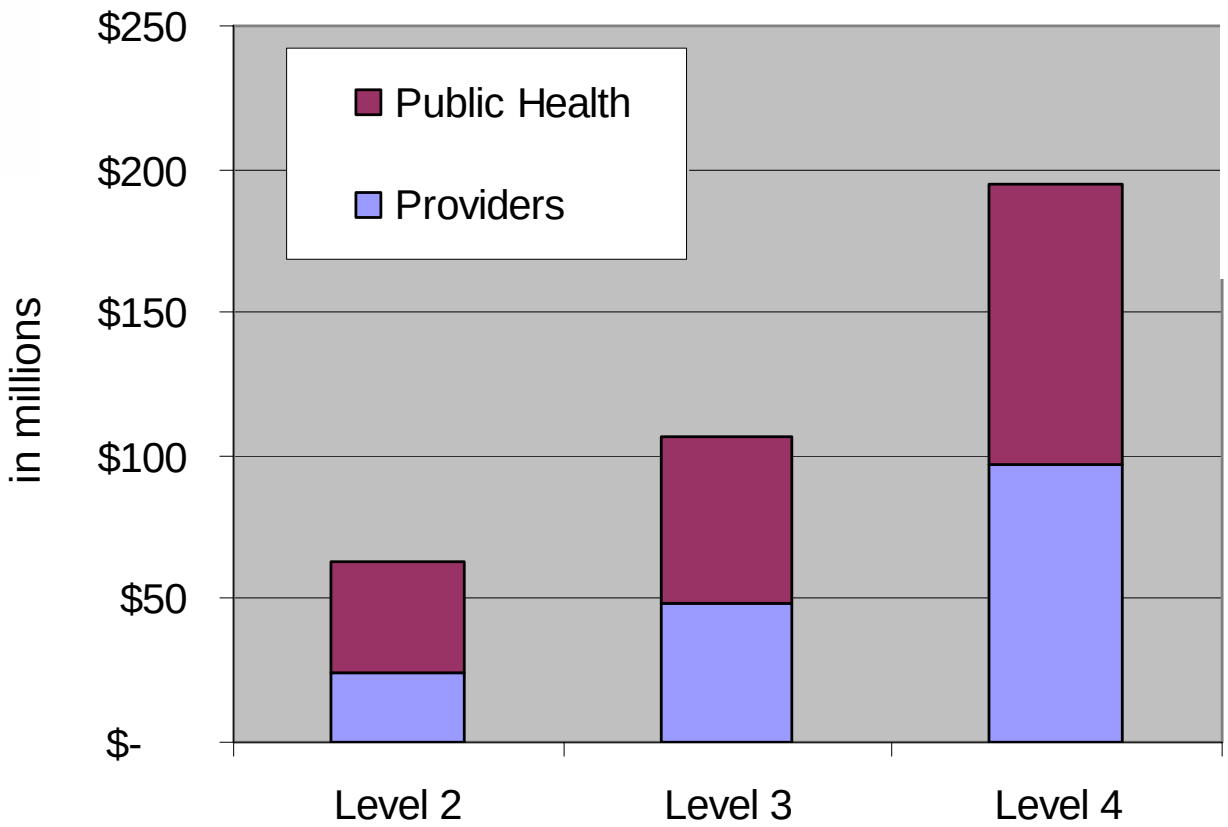


Level	
1	Paper report forms delivered by mail or verbally reported
2	Faxed case and vital statistics reports
3	Free text electronic case and vital statistics reports
4	Encoded electronic case and vital statistics reports

Provider-Public Health Key Components

- Assume that public health departments receive about eight million disease and vital statistics case reports each year
- Total provider time to file report and public health cost to receive a report is 35 minutes on each end; total annual cost of this process is $229 million
- Cost of a manual report is $14.02 on each end and the cost of an electronic report is $0.03
- Provider-Public Health HIEI will:
  - Save provider time sending reports
  - Save public health department time receiving reports

Provider-Public Health Annual Benefit



- At Level 4, the total annual benefit of $194.6 million is split equally between providers and public health departments.

Provider-Public Health HIEI

- Benefits
  - Dual use of clinical encounter data
  - Save time reporting vital statistics and disease
  - Increase reporting of notifiable disease
  - Improved public health reporting to providers
  - Bio-surveillance: identify warning signs by aggregating data from many sources
    - Earlier recognition of disease outbreaks, attacks
  - Discovery and research (genotypic-phenotypic-environmental data integration)

HIEI National Net Cost-Benefit

	Net Return over 10-year Implementation	Annual Net Return after Implementation
Level 2	$141B	$22B
Level 3	-$34B	$24B
Level 4	$337B	$78B

Value of HIE standards is the difference between Level 3 & 4

US Would Benefit from Healthcare Information Exchange

- Nationwide implementation of standardized healthcare information exchange would:
  - Save $337B over 10 years
  - Save the US $78B annually at steady state
  - Cumulative breakeven during year five of implementation
- There is a business case for standardized healthcare information exchange and interoperability

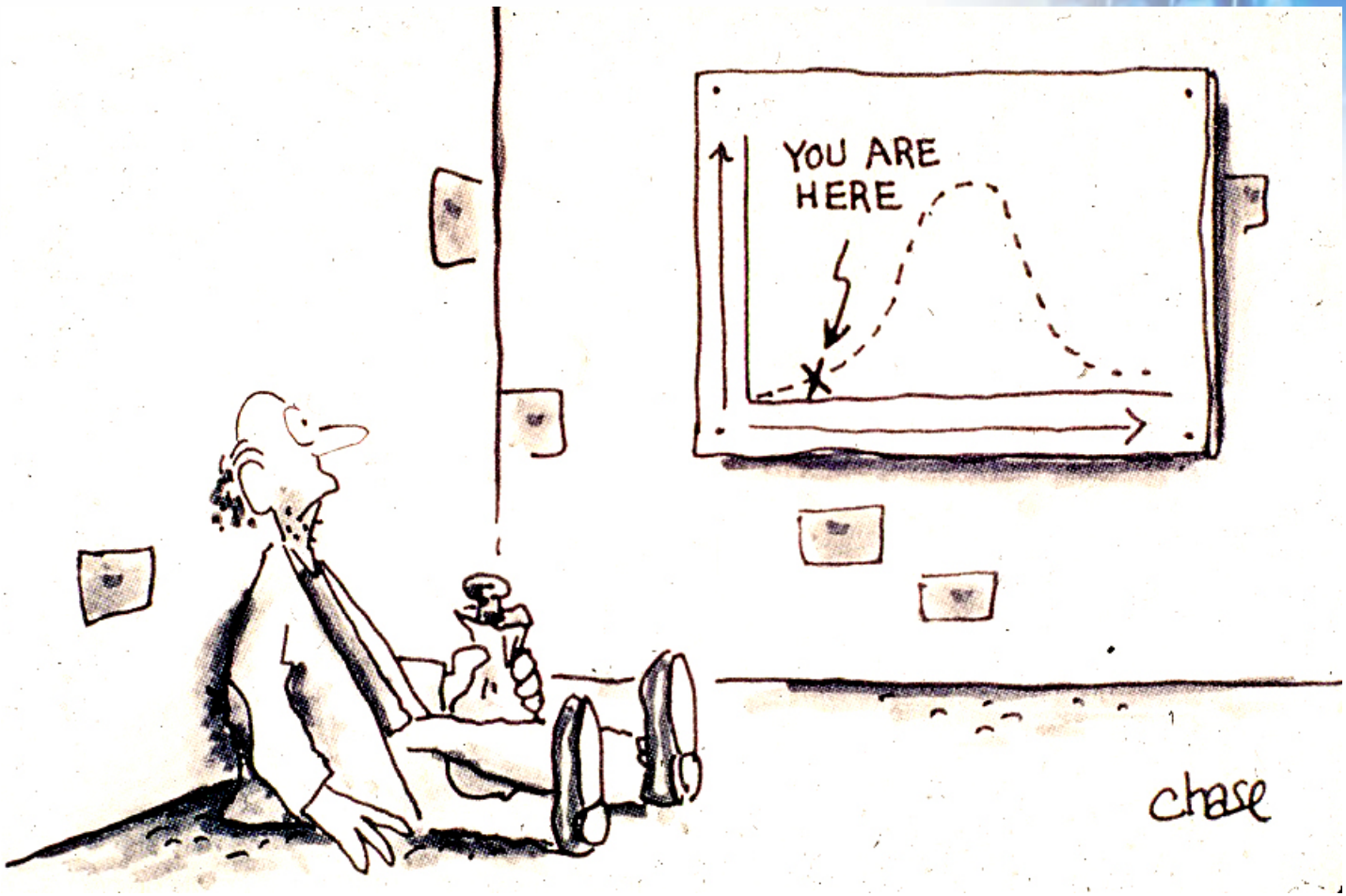
Limitations

- Our model combines evidence from the academic literature, experts, and market data
- We extrapolate to make national projections
- The model may be incomplete and important determinants missing
- Staff time estimates may be wrong
  - Model is sensitive to this variable
- Benefit from secondary transactions beyond provider-centric, encounter-based model not included

Conclusions

- NHIN is a good investment
- Standardized Level 4 HIEI is by far the best investment
  - Non-standardized HIEI is not a good investment.
  - Interfaces are expensive
- We must set minimal standards

Where Are We?



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CITL reports available at **HIMSS**: www.himss.org

Thank you!

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